Technical Support Document: 
Addressing Mobile and Nonroad Engine Testing Operations in Stationary Source Permitting

Introduction

This technical support document addresses how emissions from the manufacture of nonroad engines, nonroad equipment and nonroad vehicles are considered in stationary source air pollution control permits issued by the Wisconsin Department of Natural Resources (DNR) Air Management Program. Based on a review of applicable state and federal law, regulations, and guidance, this document concludes that, with some clearly delineated exceptions, emissions generated from internal combustion engines or equipment during the manufacturing process are stationary source emissions and therefore should be included in stationary source permits issued by the program.

Issue summary

Activities occurring at a stationary source facility can include testing or otherwise “turning on” nonroad and other mobile engines during the manufacturing of those engines or the nonroad equipment or vehicles in which the engines are being installed. These activities can include testing associated with research and development, performance testing, reliability testing, and final product checks, as well as emissions occurring at test cells and repair bays. Since emissions associated with these activities occur at a fixed location and contribute to the air pollution emitted by the stationary source, these emissions are required to be regulated as stationary source emissions under the Clean Air Act (CAA). Wisconsin has, for more than 30 years, included emissions from internal combustion engines that occur during the manufacturing process, in stationary source air permits.

In 2016, the U. S. Environmental Protection Agency (EPA) provided guidance for a John Deere facility in Dubuque, Iowa, which assembles nonroad equipment. EPA concluded that emissions from the operation of nonroad engines are not stationary source emissions at certain points in the nonroad equipment assembly or repair process. EPA subsequently provided similar guidance for several manufacturers of nonroad equipment in Wisconsin. This has prompted these facilities to apply for revised air pollution control operation permits to remove nonroad engine testing and equipment checks from their permits. This document assesses DNR’s current approach to addressing these emissions in permits in light of these developments.

Regulatory history

Emissions from engines in mobile sources such as cars and trucks, were categorized and regulated separately from stationary sources since the air permit programs were created in the early 1970s. Emissions from the use of nonroad engines were unregulated prior to the 1990 Clean Air Act Amendments. The 1990 amendments and subsequent regulations are intended to, and are in practice, filling this gap. Stationary source permits in Wisconsin have, as required under the Act, included emissions from all types of engine testing, including testing of nonroad vehicles and equipment. Even after nonroad engines were defined separately in the 1990 Clean Air Act Amendments, emissions from testing and manufacturing of mobile and nonroad equipment continued to be included in stationary source permits. Until recently, these permits were issued without comment from either facilities or EPA on the appropriateness of including engine emissions from the manufacturing process.

Beginning in 2008, states, responding to questions from industry, started asking EPA for additional clarification on whether motive engine testing operations should be considered stationary sources.1 In 2008 the Michigan Department of Natural Resources and Environment asked EPA to weigh in on how to calculate the potential to emit for engine and chassis dynamometer test cells for a permit review for Hyundai. In its 2010 response, which took into account the fact that Hyundai tested fully assembled vehicles within these units, EPA replied, “EPA

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1 EPA guidance on interaction between engine emissions and stationary source regulations: https://www.epa.gov/nsr/stationary-source-air-pollution
interprets this definition as excluding emissions from internal combustion motor vehicle engines only when those engines are being used for transportation purposes. As noted above, in the case of the Hyundai facility, the vehicles being tested on the chassis dynamometer are being used for testing purposes and have not yet been introduced into commerce. Thus, the emissions from the engines are not created while the vehicle is used for transportation purposes.”

In 2012, EPA responded to a request for guidance from Michigan Department of Environmental Quality for a permit project at General Motors that involved mobile sources. This time the question regarded “roll, road readiness, or end of line testing operations” which is where final checks are performed on fully assembled vehicles complete with VIN number, emissions certification engine labels and a fuel economy window sticker.” In this case, EPA agreed that, “because the testing is done at a point when the vehicle is ready for introduction into commerce and the testing is for the purpose of checking the vehicle’s readiness for transportation, we have concluded that the direct emissions from roll-off tests at the GM Orion facility are emissions resulting directly from internal combustion engines ‘for transportation purposes’ within the meaning of Section 302(z) of the Clean Air Act and as such the engines in the vehicles tested are not subject to stationary source requirements.”

EPA did not weigh in on the treatment of nonroad engine or equipment manufacturing in stationary source permits until later. In November 2016, EPA Region 7 responded to questions from the Iowa Department of Natural Resources (IDNR) regarding emissions from the manufacture of nonroad equipment at John Deere’s Dubuque, Iowa facility. IDNR’s questions referenced the previous guidance for on-road vehicles and asked similar questions for nonroad vehicles. IDNR sought to better understand at what point in the manufacturing process engine emissions became mobile source emissions. EPA’s response concluded that certified nonroad engines and nonroad engines are categorically excluded from the stationary source definition and that whether the equipment is partially or fully assembled has no bearing on EPA’s response. The response also concluded that roll off testing and repair bays emissions were not considered stationary source emissions.

Following these letters, DNR began receiving inquiries about applying the John Deere Dubuque conclusions to Wisconsin facilities. Because EPA’s permitting guidance is case specific unless otherwise noted, and because of the wide variety of equipment and situations under which an engine might be turned on during manufacturing, DNR advised facilities seeking clarification on their engine emissions to submit questions directly to EPA and include facility-specific facts.

EPA subsequently provided guidance for Wisconsin facilities which, with one exception,² conclude that engine emissions from the manufacturing of nonroad engines and nonroad equipment can be excluded from stationary source permitting. These EPA conclusions do not discuss specific types of engine testing activities covered in the requested clarifications. Instead, they focus on the intended end use of the engines to determine whether they are to be considered a nonroad source. EPA caveated its recommendations by stating that DNR is the regulatory authority and is responsible for making the final determinations for excluding emissions from stationary source permitting. DNR approved removal of emission testing processes from two permits based on these EPA recommendations in 2018 and 2019 before halting additional decisions pending the outcome of this assessment.

Other state approaches

To inform its understanding of this issue, DNR asked other state air agencies, including Wisconsin’s border states (Iowa, Michigan, Illinois, and Minnesota), to provide each state’s approach to nonroad engine testing in stationary source permits. Of the five states that responded, three indicated that they include nonroad engine testing in Part

² In a 2017 stationary source determination for Professional Power Products, Inc., EPA stated that “[t]he engines in this case, will be used to run power generation systems. As we understand it, these systems will be housed within the facility and are not designed or intended to be portable or transportable. Based upon this information and our reasoning, EPA’s view is that the engines used for testing 3Pi’s power generation systems will be considered a stationary source.”
permits. One state referenced a 1996 EPA memo regarding jet engine test cells. The memo states “[s]ince the engine is physically secured in the test cell, which is a permanent structure, the test cell operation is considered a stationary source.” This same state also noted that if the engine is already installed in a unit such as a lawnmower, snowmobile, car, etc., that engine is considered a nonroad engine and testing at that point is not part of the stationary source. Overall, for the three neighboring states which include test stands in Part 70 permits, the shared perspective is that the permanent test cell itself is part of the stationary source regardless of the end use of the engine placed inside.

The remaining two states held positions that the engine, if its end use will be in a mobile or nonroad source, is not part of the stationary source, and thus, testing of the engine should not be included in stationary source permits. One state refers to the 2016 EPA John Deere Dubuque guidance as a basis to remove engine testing from its stationary source permits.

Analysis of applicable statutes and regulations

Federal

The CAA defines a stationary source as “…generally any source of an air pollutant except those emissions resulting directly from an internal combustion engine for transportation purposes or from a nonroad engine or nonroad vehicle…” 42 U.S.C. § 7602(z). As noted above, prior to 1990 the CAA did not have a category or regulations for nonroad engines and equipment separate from stationary sources. The 1990 Amendments created the nonroad category and defined a regulatory approach for these engines. United States Code, Title 42, Chapter 85 § 7543(e)(1) states:

- No State or any political subdivision thereof shall adopt or attempt to enforce any standard relating to the control of emissions from either of the following new nonroad engines or nonroad vehicles subject to regulation under this chapter—
  - (A) New engines which are used in construction equipment or vehicles or used in farm equipment or vehicles and which are smaller than 175 horsepower.
  - (B) New locomotives or new engines used in locomotives. Subsection (b) of this section shall not apply for purposes of this paragraph.

Nonroad engines are addressed elsewhere in the CAA and federal code, including:

- Under United States Code, Title 42, Chapter 85, § 7550 (10), the term “nonroad engine” means an internal combustion engine (including the fuel system) that is not used in a motor vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under section 7411 of this title or section 7521 of this title.

  - Engines are regulated under New Source Performance Standards (NSPS) (section 7411) if they are stationary ICE which is defined in 40 CFR 60.4219 as follows: Stationary internal combustion engine means any internal combustion engine, except combustion turbines, that converts heat energy into mechanical work and is not mobile. Stationary ICE differ from mobile ICE in that a stationary internal combustion engine is not a nonroad engine as defined at 40 CFR 1068.30 (excluding paragraph (2)(ii) of that definition), and is not used to propel a motor vehicle, aircraft, or a vehicle used solely for competition. Stationary ICE include reciprocating ICE, rotary ICE, and other ICE, except combustion turbines.

  - Engines are regulated under National Emissions Standards for Hazardous Air Pollutants (NESHAP) (section 7521) if they are stationary RICE which is defined in 40 CFR 63.6675 as follows: Stationary reciprocating internal combustion engine (RICE) means any reciprocating internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a nonroad engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.
• Under 40 CFR 1068.30 (and the nearly identical definitions found in 40 CFR 89.2): *Nonroad engine* means:

(1) Except as discussed in paragraph (2) of this definition, a nonroad engine is an internal combustion engine that meets any of the following criteria:

(i) It is (or will be) used in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers).

(ii) It is (or will be) used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers).

(iii) By itself or in or on a piece of equipment, it is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.

(2) An internal combustion engine is not a nonroad engine if it meets any of the following criteria:

(i) The engine is used to propel a motor vehicle, an aircraft, or equipment used solely for competition.

(ii) The engine is regulated under 40 CFR part 60, (or otherwise regulated by a federal New Source Performance Standard promulgated under section 111 of the Clean Air Act (42 U.S.C. 7411)). Note that this criterion does not apply for engines meeting any of the criteria of paragraph (1) of this definition that are voluntarily certified under 40 CFR part 60.

(iii) The engine otherwise included in paragraph (1)(iii) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. For any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced, include the time period of both engines in calculating the consecutive time period.

None of the definitions above, nor the regulations promulgated at 40 CFR Parts 85-92 for specific categories of nonroad engines, discuss or mention engine testing or engine manufacturing processes. Applying the criteria at 1068.30(2)(iii) and 40 CFR 89.2 to a process line where engines are being turned on as they are being assembled indicates that these engine emissions are stationary sources because engine testing occurs at an established, nonmoving site on a process line within the facility. The engine reaches a location on the assembly line, is turned on to check for functionality, then shut off and sent on down the assembly line. The next engine then arrives for its check, replacing the preceding engine at that same location. As these replacement engines are intended to perform the same or similar function, and they remain in the same physical location for more than 12 consecutive months, 1068.30(2)(iii) and 40 CFR 89.2 would not consider these engines to be nonroad engines during this stage of the manufacturing process.

There are other federal regulations that explicitly discuss engine testing. Section 112 of the Clean Air Act established a two-stage regulatory process to address emissions of hazardous air pollutants (HAP) from stationary sources. Section 112 includes a source category and regulations for hazardous air pollutant emissions from engine test cells/stands in 40 CFR part 63 subpart PPPPP. Emissions from performance testing of “uninstalled mobile (motive) and stationary engines” are considered stationary source emissions, regardless of the end use of the engine. See 40 CFR § 63.9285.

EPA notes that test cells are permanent structures and as such, are considered stationary sources. EPA defines an “affected source” as the collection of all equipment and activities associated with engine test cells/stands used for testing uninstalled stationary or uninstalled mobile (motive) engines located at a major source of HAP emissions. “Uninstalled engine” is defined as “an engine not installed in, or an integrated part of, the final product.” These
definitions support the understanding that once an engine is installed in a final product, its testing is not included in the definition of test cell/stand and so is not regulated under section 112. It also clarifies that, when not installed or integrated into a final product, engine testing on such uninstalled engines is considered a stationary source, regardless of whether end use of those engines is in a stationary or mobile source.

40 CFR part 63 subpart PPPPP has exemptions for test cells/stands used for testing small engines (less than 19 kW) and notes that the portion of the affected sources engaged in the following activities do not need to meet the requirements of the NESHAP: test cells/stands that are used in research and teaching or that test or evaluate fuels, transmissions, or electronics. It is important to note that, while these activities do not have to meet the requirements of subpart PPPPP, they are still considered a portion of the affected source. It follows that these affected sources are stationary sources because they are regulated in a NESHAP.

Wisconsin

Construction and operation permits issued under the authority of chs. NR 405 through NR 408, Wis. Adm. Code, are applicable to stationary sources. “Stationary source” is defined in s. 285.01(41), Wis. Stats., as:

Any facility, building, structure or installation that directly or indirectly emits or may emit an air contaminant only from a fixed location. A stationary source includes an air contaminant source that is capable of being transported to a different location. A stationary source may consist of one or more pieces of process equipment, each of which is capable of emitting an air contaminant. A stationary source does not include a motor vehicle or equipment which is capable of emitting an air contaminant while moving.

While state statute does not specifically mention or define “nonroad engine,” “nonroad equipment,” or “nonroad vehicle,” the state definition of stationary source specifically excludes motor vehicles and equipment capable of emitting an air contaminant while moving. As with the federal definitions, state rules do not specifically discuss testing or emissions from engines during manufacturing of motor vehicles or equipment capable of emitting while moving.

Discussion

Despite state and federal definitions and the explicit language under 40 CFR Part 63, Subpart PPPPP, situations still remained involving nonroad engine operations that some facilities felt were not clearly addressed with regard to their status as stationary sources. In these cases, regulated facilities and states turned to EPA for case-specific guidance. EPA makes its guidance available to states and the public as a service to help clarify and consistently apply air pollution regulations. Guidance does not hold the same weight as regulations or court decisions and is case specific. EPA says in its guidance letters that the state is the permitting authority and has the ultimate responsibility of making the final determination of whether emissions from nonroad engines should be included in stationary source permits.

As noted above, the 2016 EPA guidance for John Deere’s Dubuque facility was the first EPA document that directly addressed whether nonroad engine emissions that occur during the testing and manufacture of nonroad equipment and vehicles should be removed from stationary source permits. This guidance has been used by other states and facilities to justify further determinations. DNR does not rely on the 2016 John Deere Dubuque guidance for four reasons.

First, this guidance is case specific and based on the facts and questions laid out by IDNR for the John Deere Dubuque facility. It was not intended to be used to predetermine decisions for other facilities, as each have their own unique set of considerations.

Second, EPA’s guidance does not address Wisconsin law or its state specific definition of stationary source. EPA directs DNR to make any final determinations as the regulatory authority. Because DNR’s definition of stationary source excludes equipment that is capable of emitting while moving, DNR must consider whether a piece of equipment in the process of being manufactured is equipment capable of emitting while moving. DNR concludes
that its rules clearly indicate and, in fact, were intended to exclude only fully assembled nonroad equipment from its stationary source definition.

Third, EPA’s guidance failed to fully consider 40 CFR 1068.30(2)(iii) and 40 CFR 89.2, which specifically exclude from the definition of nonroad engine those engines operated at a single location for more than 12 consecutive months and requires engines that replace an engine at the same location to be included when calculating consecutive time.

Fourth, EPA’s response to IDNR’s question as to the point in the manufacturing process where engine emissions are no longer considered stationary sources was overly broad, did not rely on explicit language in federal definitions, and failed to consider federal NESHAP regulations that clearly treat at least some engine testing as a stationary source. EPA’s conclusion that nonroad engines are categorically excluded from the stationary source definition, and that whether the equipment is partially or fully assembled has no bearing on the determination, appears to lack legal justification, as neither the federal definitions nor the plain language of 40 CFR Part 63 subpart PPPPP support these conclusions.

Subsequent EPA guidance made for individual Wisconsin facilities do not address any additional facts beyond the John Deere Dubuque memo and focus solely on whether the end use of the engines being manufactured is nonroad. None of the subsequent guidance letters offer further clarity on activities such as engine testing.

Conclusions

The Clean Air Act and its implementing regulations are clear that EPA sets emission standards for nonroad engines and regulates the sulfur content of fuels combusted in motor vehicles and nonroad engines. Stationary source permits cannot set emission standards for nonroad or mobile engines, vehicles, or equipment, and operation of this equipment, as their intended end use, are regulated separately from stationary sources.

However, EPA makes clear in its guidance that states must review their own statutes and are responsible for making the final determinations as to what sources to include in stationary source permitting. DNR will follow EPA’s direction and, where federal regulations fail to provide clarity, rely on state statutes and the specific activities occurring the individual facilities to determine how to address certain nonroad engine activities in stationary source permits.

Based on the above analysis, DNR concludes that the following activities should be included in air pollution control permits because they meet the definition of a “stationary source” under state or federal law:

- Emissions from engine test cells/stands for performance testing of uninstalled engines, no matter the type of equipment the engine will eventually be installed in. This is because engines undertaking this activity are in an immobile state and therefore are not emitting an air contaminant while moving, consistent with the federal NESHAP regulations.

- Emissions from operation of partially assembled motor vehicles and other nonroad equipment prior to being introduced into commerce, because the partially assembled equipment is similarly immobile and not capable of emitting while moving. For example, a facility manufactures lawnmowers. Once a nonroad engine is installed on a partially assembled lawnmower, the engine is turned on to test functionality of mower parts prior to the partially assembled lawnmower moving to the next step of the assembly line.

- Emissions from fully or partially assembled motor vehicles and other nonroad equipment that will not be introduced into commerce. Because this equipment will never become a final product it cannot be concluded to be nonroad equipment and will not, in actual use, emit while moving. While the examples below are not specifically performance testing covered by the NESHAP, the conclusion is consistent with the definition of uninstalled engine as the affected unit in federal NESHAP subpart PPPPP. Examples include:
- Engines being tested for research and development.
- Engines being tested for quality control, reliability, or diagnostics.
- Other engine testing where the equipment is not destined to be introduced into commerce.

Conversely, the following activities are not to be included in air pollution control permits because they are not considered to be stationary source emissions:

- Emissions from the operation (use on site) of fully assembled and functional motor vehicles and other nonroad equipment capable of emitting an air contaminant while moving. Examples include the operation of fully assembled cars, trucks, ATVs, tractors, forklifts, lawn mowers, leaf and snow blowers, and portable generators at or within a facility.

- Emissions from fully assembled and functional motor vehicles or nonroad equipment being driven to a loading dock or warehouse. For example, a facility manufactures UTVs. After the UTVs are assembled, they are driven to the loading dock for transport to another location for storage or sale.

- Emissions from the operation of fully assembled and functional motor vehicles and other nonroad equipment prior to being introduced into commerce. For example, a facility manufactures snowblowers. Once a nonroad engine is installed on a fully assembled snowblower, the engine is turned on to test readiness of the complete product for sale.